

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (Currently Amended) An information recording apparatus for recording information on a predetermined recording medium, said information recording apparatus comprising:

creation means for creating search data from main image data; and

recording means for recording said search data created by said creation means and said main image data on said recording medium,

wherein said creation means creates first data by which an image can be displayed over one entire one screen, and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, and said recording means records said first data and said second data in a predetermined sequence,

wherein the first data includes three macro blocks including a macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a macro block such that discrete cosine components are extracted from a first color-difference signal of a discrete cosine transform block and a macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

wherein the second data includes three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

2. (Original) An information recording apparatus according to claim 1, wherein said recording means records said second data after said first data is recorded.

3. (Original) An information recording apparatus according to claim 1, wherein said creation means creates each of said first data and said second data in such a manner so as to be divided into a plurality of portions in predetermined units.

4. (Original) An information recording apparatus according to claim 3, wherein said predetermined units are units of blocks in which error checking is performed.

5. (Original) An information recording apparatus according to claim 3, wherein said creation means creates said second data corresponding to the central portion of one screen of said image, and at least one piece of said second data corresponding to a portion which is outside the central portion, and said recording means records a plurality of pieces of said second data in a sequence from the data corresponding to the central portion of one screen of said image to the data corresponding to a portion outside the central portion.

6. (Original) An information recording apparatus according to claim 3, wherein said recording means records said first data in said predetermined units in such a manner as to be obtained by one trace during reading.

7. (Original) An information recording apparatus according to claim 1, wherein said search data is composed of image data and control data, said control data has a packet structure in which a search header and subcode data which is the same as said main image data are written in such a manner so as to be divided, and the packet header of said packet structure indicates which data is written in said control data.

8. (Currently Amended) An information recording method for use with an information recording apparatus for recording information on a predetermined recording medium, said information recording method comprising:

a creation step for creating search data from main image data; and

a recording step for recording said search data created in said creation step and said main image data on said recording medium,

wherein, in said creation step, first data by which an image can be displayed over one entire screen and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, are created, and in said recording step, said first data and said second data are recorded in a predetermined sequence,

wherein the first data includes three macro blocks including a macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a macro block such that discrete cosine components are extracted from a first color-

difference signal of a discrete cosine transform block and a macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

wherein the second data includes three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

9. (Currently Amended) A recording medium having recorded thereon a computer-readable program for use with an information recording apparatus for reading information on a predetermined recording medium, said program comprising:

a creation step for creating search data from main image data; and

a recording step for recording said search data created in said creation step and said main image data on said recording medium,

wherein, in said creation step, first data by which an image can be displayed over one entire screen, and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, are created, and in said recording step, said first data and said second data are recorded in a predetermined sequence,

wherein the first data includes three macro blocks including a first macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a second macro block such that discrete cosine components are extracted from a first color-difference signal of a discrete cosine transform block and a third macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

wherein the second data includes three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

10. (Currently Amended) An information reading apparatus for reading information recorded on a predetermined recording medium, said information reading apparatus comprising:

acquiring means for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

display control means for controlling the display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data comprises:

first data having three macro blocks including a first macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a second macro block such that discrete cosine components are extracted from a first color-difference signal of a discrete cosine transform block and a third macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

second data having three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

11. (Original) An information reading apparatus according to claim 10, further comprising interpolation means for interpolating a display image by using said search data

obtained by said acquiring means when said search data obtained by said acquiring means is less than the required amount of data for one screen of the display image.

12. (Currently Amended) An information reading method for use with an information reading apparatus for reading information recorded on a predetermined recording medium, said information reading method comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data comprises:

first data having three macro blocks including a first macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a second macro block such that discrete cosine components are extracted from a first color-difference signal of a discrete cosine transform block and a third macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

second data having three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

13. (Currently Amended) A recording medium having recorded thereon a computer-readable program for use in an information reading apparatus for reading information recorded on a predetermined recording medium, said program comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data comprises:

first data having three macro blocks including a first macro block such that discrete cosine components are extracted from a luminance signal of a discrete cosine transform block, a second macro block such that discrete cosine components are extracted from a first color-difference signal of a discrete cosine transform block and a third macro block such that discrete cosine components are extracted from a second color-difference signal of a discrete cosine transform block, and

second data includes three macro blocks such that discrete cosine components are extracted from each of three luminance signals of a discrete cosine transform blocks.

14. – 20. (Canceled)

21. (New) An information recording apparatus for recording information on a predetermined recording medium, said information recording apparatus comprising:

creation means for creating search data from main image data; and

recording means for recording said search data created by said creation means and said main image data on said recording medium,

wherein said creation means creates first data by which an image can be displayed over one entire one screen, and second data for enhancing the image quality of said image displayed

by said first data, each being used as said search data, and said recording means records said first data and said second data in a predetermined sequence,

wherein the search data for nine traces of the recording medium are arranged across 144 tracks separated into four traces of first data and second data of five traces.

22. (New) An information recording apparatus according to claim 21,
wherein said recording means records said second data after said first data is recorded.

23. (New) An information recording apparatus according to claim 21,
wherein said creation means creates each of said first data and said second data in such a manner
so as to be divided into a plurality of portions in predetermined units.

24. (New) An information recording apparatus according to claim 23,
wherein said predetermined units are units of blocks in which error checking is performed.

25. (New) An information recording apparatus according to claim 23,
wherein said creation means creates said second data corresponding to the central portion of one
screen of said image, and at least one piece of said second data corresponding to a portion which
is outside the central portion, and said recording means records a plurality of pieces of said
second data in a sequence from the data corresponding to the central portion of one screen of
said image to the data corresponding to a portion outside the central portion.

26. (New) An information recording apparatus according to claim 23,
wherein said recording means records said first data in said predetermined units in such a manner
as to be obtained by one trace during reading.

27. (New) An information recording apparatus according to claim 21,
wherein said search data is composed of image data and control data, said control data has a
packet structure in which a search header and subcode data which is the same as said main image
data are written in such a manner so as to be divided, and the packet header of said packet
structure indicates which data is written in said control data.

28. (New) An information recording method for use with an information
recording apparatus for recording information on a predetermined recording medium, said
information recording method comprising:

 a creation step for creating search data from main image data; and
 a recording step for recording said search data created in said creation step and said main
image data on said recording medium,

 wherein, in said creation step, first data by which an image can be displayed over one
entire screen and second data for enhancing the image quality of said image displayed by said
first data, each being used as said search data, are created, and in said recording step, said first
data and said second data are recorded in a predetermined sequence,

 wherein the search data for nine traces of the recording medium are arranged across 144
tracks separated into four traces of first data and second data of five traces.

29. (New) A recording medium having recorded thereon a computer-readable program for use with an information recording apparatus for reading information on a predetermined recording medium, said program comprising:

a creation step for creating search data from main image data; and
a recording step for recording said search data created in said creation step and said main image data on said recording medium,

wherein, in said creation step, first data by which an image can be displayed over one entire screen, and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, are created, and in said recording step, said first data and said second data are recorded in a predetermined sequence,

wherein the search data for nine traces of the recording medium are arranged across 144 tracks separated into four traces of first data and second data of five traces.

30. (New) An information reading apparatus for reading information recorded on a predetermined recording medium, said information reading apparatus comprising:

acquiring means for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

display control means for controlling the display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data for nine traces of the recording medium are arranged across 144 tracks separated into four traces of first data and second data of five traces.

31. (New) An information reading apparatus according to claim 30, further comprising interpolation means for interpolating a display image by using said search data obtained by said acquiring means when said search data obtained by said acquiring means is less than the required amount of data for one screen of the display image.

32. (New) An information reading method for use with an information reading apparatus for reading information recorded on a predetermined recording medium, said information reading method comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data for nine traces of the recording medium are arranged across 144 tracks separated into four traces of first data and second data of five traces.

33. (New) A recording medium having recorded thereon a computer-readable program for use in an information reading apparatus for reading information recorded on a predetermined recording medium, said program comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein the image data for nine traces of the recording medium are arranged across 144 tracks separated into four traces of first data and second data of five traces.

34. (New) An information recording apparatus for recording information on a predetermined recording medium, said information recording apparatus comprising:

creation means for creating search data from main image data; and

recording means for recording said search data created by said creation means and said main image data on said recording medium,

wherein said creation means creates first data by which an image can be displayed over one entire one screen, and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, and said recording means records said first data and said second data in a predetermined sequence,

wherein a sync block of the recording medium includes macro blocks that correspond with the image displayed such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.

35. (New) An information recording apparatus according to claim 34, wherein said recording means records said second data after said first data is recorded.

36. (New) An information recording apparatus according to claim 34, wherein said creation means creates each of said first data and said second data in such a manner so as to be divided into a plurality of portions in predetermined units.

37. (New) An information recording apparatus according to claim 36, wherein said predetermined units are units of blocks in which error checking is performed.

38. (New) An information recording apparatus according to claim 36, wherein said creation means creates said second data corresponding to the central portion of one screen of said image, and at least one piece of said second data corresponding to a portion which is outside the central portion, and said recording means records a plurality of pieces of said second data in a sequence from the data corresponding to the central portion of one screen of said image to the data corresponding to a portion outside the central portion.

39. (New) An information recording apparatus according to claim 36, wherein said recording means records said first data in said predetermined units in such a manner as to be obtained by one trace during reading.

40. (New) An information recording apparatus according to claim 34, wherein said search data is composed of image data and control data, said control data has a packet structure in which a search header and subcode data which is the same as said main image data are written in such a manner so as to be divided, and the packet header of said packet structure indicates which data is written in said control data.

41. (New) An information recording method for use with an information recording apparatus for recording information on a predetermined recording medium, said information recording method comprising:

a creation step for creating search data from main image data; and

a recording step for recording said search data created in said creation step and said main image data on said recording medium,

wherein, in said creation step, first data by which an image can be displayed over one entire screen and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, are created, and in said recording step, said first data and said second data are recorded in a predetermined sequence,

wherein a sync block of the recording medium includes macro blocks that correspond with the image displayed such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.

42. (New) A recording medium having recorded thereon a computer-readable program for use with an information recording apparatus for reading information on a predetermined recording medium, said program comprising:

a creation step for creating search data from main image data; and

a recording step for recording said search data created in said creation step and said main image data on said recording medium,

wherein, in said creation step, first data by which an image can be displayed over one entire screen, and second data for enhancing the image quality of said image displayed by said first data, each being used as said search data, are created, and in said recording step, said first data and said second data are recorded in a predetermined sequence,

wherein a sync block of the recording medium includes macro blocks that correspond with the image displayed such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.

43. (New) An information reading apparatus for reading information recorded on a predetermined recording medium, said information reading apparatus comprising:

acquiring means for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

display control means for controlling the display position of said image data on the basis of coordinate information contained in said control data,

wherein a sync block of the recording medium includes macro blocks that correspond with the image data such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.

44. (New) An information reading apparatus according to claim 43, further comprising interpolation means for interpolating a display image by using said search data obtained by said acquiring means when said search data obtained by said acquiring means is less than the required amount of data for one screen of the display image.

45. (New) An information reading method for use with an information reading apparatus for reading information recorded on a predetermined recording medium, said information reading method comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein a sync block of the recording medium includes macro blocks that correspond with the image data such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.

46. (New) A recording medium having recorded thereon a computer-readable program for use in an information reading apparatus for reading information recorded on a predetermined recording medium, said program comprising:

an acquiring step for acquiring search data, which is composed of image data and control data, recorded on said recording medium; and

a display control step for controlling a display position of said image data on the basis of coordinate information contained in said control data,

wherein a sync block of the recording medium includes macro blocks that correspond with the image data such that macro blocks of the first data are mapped to the display image, left to right, from an X address of a start macro block within the sync block and a Y address of the start macro block within the sync block of a sync block header, and

wherein the sync block header includes a picture class ID to indicate whether the search data is first data or second data.